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**Forestry Division**

**FOREST HEALTH**

**CONDITIONS REPORT**

**STATE AND PRIVATE LANDS - ARIZONA**

**2007**

Defoliating insects were easily the most visible biological agents affecting the health of our forests in 2007. The drought conditions we have been experiencing may be a factor in the spread of some of these insects.

First up was a dramatic increase in the population of pinyon needle scale in the Payson area in March. These defoliating insects were first detected in 1986 at the south end of town on a few small pinyons. An estimated 900 acres were infested in southeast Payson in 2007. The insect can become a chronic problem once it becomes well established.

This chronic condition is best seen in the Prescott area where the insect has spread over thousands of acres in the last 30-50 years. Pinyon needle scale can be found from Prescott Country Club to the Prescott Basin, & to Williamson Valley all the way up to Hootenanny Holler. Two areas where heavy populations of these insects hatched in spring include, the Thumb Butte area in the Prescott Basin & Granite Oaks in Williamson Valley. Chronic defoliation by these insects has already killed many pinyons growing on drier rocky outcrops, south & west facing slopes, & transitional zones between pinyon-juniper and grassland vegetation types. They are being replaced by junipers & chaparral species.

In late September, yet another site infested with pinyon needle scale was detected just north of Payson. A population of these insects was found in the northwest corner of Beaver Valley Estates. An estimated 24 acres are infested in the subdivision, but the population appears to extend into the adjacent Tonto National Forest.

Even more dramatic was the detection in late June of a very large population of pine sawfly caterpillars, defoliating ponderosa pines along Highway 260 just east of Overgaard, stretching all the way to Pinedale – a distance of about 16 miles! An estimated 1000 acres were defoliated by this insect. Many of the trees defoliated by the sawflies were the survivors of the “Rodeo-Chediski Fire” in 2002 & may not survive a second year of defoliation. Especially, ponderosa pines damaged by the fire & stressed by drought. Smaller pines may be the most susceptible. However, few cocoons of these insects were collected in August in this area, and may indicate a dramatic decrease in the sawfly population due to natural causes. In late June, a patch of dead sawfly caterpillars was located underneath a ponderosa pine growing along Highway 260. They may have been victims of the cold snap on June 6<sup>th</sup>. These insects are known to cause spectacular defoliation for a year or two and then return to endemic levels.

The other defoliating insect that made a splash in 2007 was the fall webworm. This insect is normally found at the lower elevations where cottonwoods & walnuts are abundant. Heavily infested cottonwoods were detected in the Camp Verde area in September with small trees thoroughly enveloped in the webbing produced by this caterpillar. On walnuts, Gila County seems to be a favorite location for the presence of this insect. Previous increases in populations of this insect in Gila County occurred in 1984, 1992-1993 and 1998-2000. Although Arizona walnut is the most common host, other shade, fruit, and ornamental trees are also attractive to these caterpillars.

Prior to 1999 fall webworm had not been detected above the Mogollon Rim. In 2007, the webworm was found scattered from Forest Lakes to Heber-Overgaard to Show Low to Vernon. In addition, two new hosts for this insect were recorded above the Rim – Blueberry Elder and Siberian Elm. The increase in the distribution of this insect may be related to mild winters. In addition, the possibility exists that climate change may also be a factor in increasing the spread of this insect in Arizona.

Temperature extremes were also a factor in 2007 with the very cold temperatures experienced in mid-January. Plants not native to the area were widely damaged by the cold temperatures in the Village of Oak Creek and Sedona. Eucalyptus, oleanders, palms and photinias were some examples noted. In addition, apparently even some native sugar sumacs growing along drainages were damaged by the cold. The cold snap experienced on June 6<sup>th</sup> also caused very noticeable damage to the new growth of ornamental spruces in and around the Flagstaff area. Damage to the new growth of Douglas-firs caused by the cold snap was also visible in the Summerhaven area of the Catalina Mountains in July.

Juniper mortality precipitated by drought has been noted in the State since at least 1996. In 2007, scattered juniper mortality was visible in the west Sedona area and at the juncture of I-17 & the Sedona exit. In addition, juniper mortality continues to be noted north and west of Show Low. Secondary activity by juniper beetles has been reported in this area in the past. Scattered juniper mortality was also noted in other parts of the state. However, this mortality is mainly due to the unhealthy conditions of our woodlands caused by the lack of historical fires. Fires used to burn over large areas about every 10-30 years through dead, dry grass in late summer and fall thinning out the junipers. The introduction of livestock removed most of the grasses that fueled these fires, allowing juniper density to dramatically increase and invade drier, grassland sites during wetter periods. The density and growth of junipers into drier grassland sites makes them more susceptible to drought, secondary insects and juniper mistletoe infections.

Forest diseases were also prominent in the state in 2007. Easily, the most visible was aspen leaf rust in the White Mountains in September and October. Previous increases in this disease have been noted in this area in 1977, 1986 and 1992. Infected aspen leaves turned a premature yellow and fell off well before the normal fall color change. During wet summers, this fungus builds to outbreak levels in susceptible aspen clones. Some of the affected areas include Green's Peak, Sunrise & also east of Big Lake. Scattered, infected ornamental plantings of aspen were also detected in Greer and Show Low-Lakeside-Pinetop. Although growth loss occurs in heavily infected trees, trees typically recover from one season of infection. However, we may see further decline in aspens already weakened from the long-term drought.

A second consecutive year of leaf infections caused by walnut anthracnose was noted mainly in the Prescott area in August. The disease is normally not a serious concern unless it's present for more than one consecutive season. The premature defoliation will reduce growth and weaken the tree. The quantity and quality of the walnuts can also be reduced. If premature defoliation occurs repeatedly, dieback of twigs and branches may be noted. The disease was very visible in the Highland Pines area, Thumb Butte and along upper White Spar Road.

Pinyon dwarf mistletoe, a parasitic plant was noted along Williamson Valley Road north of Prescott in April. A large swath of infected pinyons was identified at about mile post 15. Heavy brooming of branches and scattered dead pinyons were noted next to the highway. These pinyons were also heavily infested with pinyon needle scale. This is the second major site in the Prescott area where this parasitic plant has been identified.

A second Austrian pine infected with Southwestern dwarf mistletoe was found planted underneath infected ponderosa pines in Strawberry in May. The first one

was identified in 1993. Other non-native pines that have been infected by this native parasitic plant in the state include Mugho and Scotch pine. Planting of these non-native pines under infected ponderosa pines is not recommended.

A new detection for the Prescott area in August was a reddening or bronzing of chokecherry leaves. Discolored plants were found in the Thumb Butte recreation area and in a drainage in Ponderosa Park. Affected leaves were easily stripped from the branches. Cause is unknown and affected plants will be re-examined in 2008 for a causal agent (s).

Damage mainly to the needles of ponderosa pines caused by the use of magnesium chloride (MgCl<sub>2</sub>) for dust abatement, was first noted along unpaved roads in the White Mountains in 2000. In June 2007, additional trees and shrubs were affected by the chemical in Greer, Nutrioso and Alpine. Discolored ponderosa pines, spruces, aspens and Arizona rose were visible in the Greer area. MgCl<sub>2</sub> burn was also noted on ponderosa pines in Nutrioso and possibly on pinyon pines. The classic symptom noted on pines is needle tip burn or discoloration. On leaves, the edges turn brown. Care should be exercised when applying this chemical to avoid or reduce damage to valuable trees and shrubs growing along unpaved roadways.

The continued expansion of non-native invasive plants in Arizona becomes a bigger concern with every passing year. Sweet resinbush, which was mistakenly planted in the 1930's, has been identified in ten different locations in the state. This plant from Africa can outcompete our native plants creating very erodible soils. Efforts are underway to reduce the impact of this plant through several treatment techniques. However, a long-term commitment is needed to have any affect on this or other non-native, invasive plants in Arizona.

Miscellaneous detections in 2007 include increased activity by tent caterpillars in spring mainly on aspens in the Flagstaff area, spider mites on Douglas-fir in Prescott in July, pinyon tip/ponderosa pine tip moth damage in Doney Park in July east of Flagstaff, slime mold underneath junipers in Timberland acres west of Show Low in August, and an assortment of colorful fruiting bodies of fungi in the Alpine area also in August. Bark beetles made a late August entrance southwest of Prescott on ponderosa pines, and spittlebugs were found on Arizona alders in Washington Park north of Payson in September. These miscellaneous detections are just a cross section of additional biological agents found in our forests in 2007.

For further information about any of these observations, contact:  
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